

This listing of claims will replace all prior versions, and listings, of claims in the application:

1 Claim 1 (currently amended): A device for photographing
2 an image of a subject, comprising:
3 a solid-state imaging device which has an imaging
4 surface composed of a large number of pixel elements
5 struck by light rays from the subject, which includes a
6 charge accumulating section for converting the incident
7 light rays into charges by the pixel elements and
8 accumulating the charges, a charge transfer section for
9 receiving the charges from the charge accumulating
10 section and transferring them, and a output section for
11 outputting the transferred charges as an image signal;
12 driving means which generates a normal driving
13 signal in a normal driving mode to drive the accumulating
14 section and the transfer section for transferring the
15 charges accumulated in the charge accumulating section to
16 the charge transfer section at a normal transfer rate and
17 causing the imaging device to output the image signal
18 from the output section, and which further generates a
19 charge discharging signal for discharging the charges
20 from the charge accumulating section outside the imaging
21 device and a high transfer rate driving signal for
22 transferring the charges in the charge transfer section
23 at a high transfer rate higher than the normal transfer
24 rate in a charge discharge mode;

25 optical shutter means which is capable of switching
26 between an opening mode that permits light rays to
27 impinge on the imaging surface of the imaging device and
28 a closing mode that inhibits light rays from impinging on
29 the imaging surface, the optical shutter having a delay
30 in switching from the closing mode to the opening mode or
31 from the opening mode to the closing mode; and

32 exposure control means for controlling the amount of
33 light rays that reaches the imaging surface by

34 controlling the driving means and shutter means, wherein
35 the exposure control means switches the shutter
36 means to the closing mode at a first time in response to
37 the start in photographing the image of the subject,

38 causes the driving means to start to supply the
39 charge discharging signal to the imaging device at the
40 first time, thereby discharging the accumulated charges
41 from the accumulating section to the outside of the
42 imaging ~~imaging~~ device in the charge discharge mode,

43 causes the driving means to start to supply a high
44 transfer rate driving signal to the imaging device at the
45 first time, thereby driving the charge transfer section
46 at high transfer rate for a specific period, the charges
47 being transferred in the charge transfer section to the
48 outside of the imaging device via the output section in
49 the charge discharge mode,

50 causes the driving means to stop supplying the high
51 transfer rate driving signal to the imaging device at a

52 second time, thereby stopping the driving of the charge
53 transfer section,
54 switches the shutter means from the closing mode to
55 the opening mode after the second time and keeps the
56 shutter means in the opening mode after a third time,
57 causes the driving means to stop supplying the
58 charge discharging signal to the imaging device at a time
59 substantially equal to or before the third time and the
60 charge accumulating section to start to accumulate
61 charges,
62 switches the shutter means to the closing mode at a
63 fourth time within a exposure period from the third time,
64 and
65 causes the driving means to supply a normal driving
66 signal to the imaging device at a fifth time, until when
67 the shutter means has been kept in the closing mode since
68 the fourth time, thereby driving the charge transfer
69 section in the normal driving mode, which causes the
70 charge transfer section to output an image signal outside
71 the imaging device.

1 Claim 2 (original): The device according to claim 1,
2 wherein the fourth time almost coincides with the
3 exposure period from the third time, and
4 the fifth time coincides with the time when a delay
5 of Δt in the optical shutter means has elapsed since the
6 fourth time.

1 Claim 3 (original): The device according to claim 1,
2 wherein the fourth time is set before the exposure period
3 has elapsed since the third time, the exposure period
4 ending before the delay in the optical shutter means has
5 elapsed since the fourth time.

1 Claim 4 (original): The device according to claim 3,
2 wherein the exposure control means causes the driving
3 means to supply a high transfer rate driving signal to
4 the imaging device at a sixth time that the delay in the
5 optical shutter means has elapsed since the fourth time,
6 thereby driving the charge transfer section at high
7 transfer rate for a second specific period, which
8 discharges the charges from the charge transfer section
9 to the outside of the imaging device, and at the fifth
10 time that the second specific period of the high transfer
11 rate driving has elapsed, causes the driving means to
12 supply a normal driving signal to the imaging device,
13 thereby driving the charge transfer section in the normal
14 driving mode, which causes the charge transfer section to
15 output an image signal outside the imaging device.

1 Claim 5 (currently amended): A device for photographing
2 an image of a subject, comprising:
3 a solid-state imaging device which has an imaging
4 surface composed of a large number of pixel elements

5 struck by light rays from the subject, which includes a
6 charge accumulating section for converting the incident
7 light rays into charges by the pixel elements and
8 accumulating the charges, a charge transfer section for
9 receiving the charges from the charge accumulating
10 section and transferring them, and a output section for
11 outputting the transferred charges as an image signal;
12 driving means which generates a normal driving
13 signal in a normal driving mode to drive the accumulating
14 section and the transfer section for transferring the
15 charges accumulated in the charge accumulating section to
16 the charge transfer section at a normal transfer rate and
17 causing the imaging device to output the image signal
18 from the output section, and which further generates a
19 charge discharging signal for discharging the charges
20 from the charge accumulating section outside the imaging
21 device and a high transfer rate driving signal for
22 transferring the charges in the charge transfer section
23 at a high transfer rate higher than the normal transfer
24 rate in a charge discharge mode;
25 optical shutter means which is capable of switching
26 between an opening mode that permits light rays to
27 impinge on the imaging surface of the imaging device and
28 a closing mode that inhibits light rays from impinging on
29 the imaging surface, the optical shutter having a delay
30 in switching from the closing mode to the opening mode or
31 from the opening mode to the closing mode; and

32 exposure control means which controls the amount of
33 light rays that reaches the imaging surface by
34 controlling the driving means and shutter means and
35 includes means for determining an exposure time and means
36 for comparing the determined exposure time with a
37 reference exposure time and setting one of a first and a
38 second photographic mode, wherein, in the first
39 photographic mode,

40 the exposure control means switches the shutter
41 means to the closing mode at a first time in response to
42 the start in photographing the image of the subject,

43 causes the driving means to start to supply the
44 charge discharging signal to the imaging device at the
45 first time, thereby discharging the accumulated charges
46 from the accumulating section to the outside of the
47 imaging ~~imaging~~ device in the charge discharge mode,

48 causes the driving means to start to supply a high
49 transfer rate driving signal to the imaging device at the
50 first time, thereby driving the charge transfer section
51 at high transfer rate for a first specific period, the
52 charges being transferred in the charge transfer section
53 to the outside of the imaging device via the output
54 section in the charge discharge mode,

55 causes the driving means to stop supplying the high
56 transfer rate driving signal to the imaging device at a
57 second time, thereby stopping the driving of the charge
58 transfer section,

59 switches the shutter means from the closing mode to
60 the opening mode after the second time and keeps the
61 shutter means in the opening mode after a third time,
62 causes the driving means to stop supplying the
63 charge discharging signal to the imaging device at a time
64 substantially equal to or before the third time and the
65 charge accumulating section to start to accumulate
66 charges,
67 switches the shutter means to the closing mode at a
68 fourth time within the exposure time from the third time,
69 and
70 causes the driving means to supply a normal driving
71 signal to the imaging device at a fifth time, until when
72 the shutter means has been kept in the closing mode since
73 the fourth time, thereby driving the charge transfer
74 section in the normal driving mode, which causes the
75 charge transfer section to output an image signal outside
76 the imaging device;
77 in the second photographic mode,
78 the exposure control means switches the shutter
79 means to the closing mode at the first time in response
80 to the start in photographing the image of the subject,
81 causes the driving means to start to supply a charge
82 discharging signal to the imaging device at the first
83 time, thereby discharging the accumulated charges from
84 the charge accumulating section to the outside of the
85 imaging device,

86 causes the driving means to start to supply a high
87 transfer rate driving signal to the imaging device at the
88 first time, thereby driving the charge transfer section
89 at high transfer rate for a second specific period, which
90 transfers the charges in the charge transfer section
91 outside the imaging device,
92 causes the driving means to stop supplying the high
93 transfer rate driving signal to the imaging device at the
94 second time, thereby stopping the driving of the charge
95 transfer section,
96 switches the shutter means from the closing mode to
97 the opening mode after the second time and keeps the
98 shutter means in the opening mode at the third time,
99 causes the driving means to stop supplying the
100 charge discharging signal to the imaging device at the
101 third time and the charge accumulating section to start
102 to accumulate charges,
103 switches the shutter means to the closing mode at
104 the fourth time that the exposure time has elapsed since
105 the third time, the exposure time ending before the delay
106 Δt in the optical shutter means has elapsed since the
107 fourth time, and
108 causes the driving means to supply a high transfer
109 rate driving signal to the imaging device at the sixth
110 time that the delay Δt in the optical shutter means has
111 elapsed since the fourth time, thereby driving the charge
112 transfer section at high transfer rate for a third

113 specific period and discharging the charges in the charge
114 transfer section to the outside of the imaging device,
115 and at the fifth time that the specific period of the
116 high transfer rate driving has elapsed, causes the
117 driving means to supply a normal driving signal to the
118 imaging device, thereby driving the charge transfer
119 section in the normal mode, which causes the charge
120 transfer section to output an image signal outside the
121 imaging device.

1 Claim 6 (original): The device according to claim 5,
2 wherein the reference exposure time is set to $TC = dt/2$
3 to $2dt$, where dt means a delay in the optical shutter
4 means.

1 Claim 7 (original): The device according to claim 6,
2 wherein the first photographic mode is set when the
3 specific exposure time T_s fulfills the expression $T_s <$
4 TC , whereas the second photographic mode is set when the
5 specific exposure time T_s fulfills the expression $T_s \geq$
6 TC .

1 Claim 8 (original): The device according to claim 5,
2 wherein the reference exposure time is set at 1.4 ms.

1 Claim 9 (original): The device according to claim 5,
2 wherein the period from the first time to second time is

3 set at $1T_{fr}/X$ or more, during which period the driving
4 means supplies the high transfer rate driving signal to
5 the imaging device, thereby driving the charge transfer
6 section at high transfer rate for the first specific
7 period, which transfers the charges from the charge
8 transfer section to the outside of the imaging device,
9 where X means a multiple of the high transfer rate
10 transfer rate with respect to the normal transfer rate
11 and $1T_{fr}$ means a read period for one screen.

1 Claim 10 (original): A method of controlling the amount
2 of light rays that reaches an imaging surface by
3 controlling driving means and shutter means in an image
4 pickup device including
5 a solid-state imaging device which has an imaging
6 surface composed of a large number of pixel elements
7 struck by light rays from the subject, which includes a
8 charge accumulating section for converting the incident
9 light rays into charges by the pixel elements and
10 accumulating the charges, a charge transfer section for
11 receiving the charges from the charge accumulating
12 section and transferring them, and a output section for
13 outputting the transferred charges as an image signal;
14 driving means which generates a normal driving
15 signal in a normal driving mode to drive the accumulating
16 section and the transfer section for transferring the
17 charges accumulated in the charge accumulating section to

18 the charge transfer section at a normal transfer rate and
19 causing the imaging device to output the image signal
20 from the output section, and which further generates a
21 charge discharging signal for discharging the charges
22 from the charge accumulating section outside the imaging
23 device and a high transfer rate driving signal for
24 transferring the charges in the charge transfer section
25 at a high transfer rate higher than the normal transfer
26 rate in a charge discharge mode; and

27 optical shutter means which is capable of switching
28 between an opening mode that permits light rays to
29 impinge on the imaging surface of the imaging device and
30 a closing mode that inhibits light rays from impinging on
31 the imaging surface, the optical shutter having a delay
32 in switching from the closing mode to the opening mode or
33 from the opening mode to the closing mode, the method
34 comprising the steps of:

35 switching the shutter means to the closing mode at a
36 first time in response to the start in photographing the
37 image of the subject,

38 causing the driving means to start to supply a
39 charge discharging signal to the imaging device at the
40 first time, thereby discharging the accumulated charged
41 from the charge accumulating section to the outside of
42 the imaging device,

43 causing the driving means to start to supply a high
44 transfer rate driving signal to the imaging device at the

45 first time, thereby driving the charge transfer section
46 at high transfer rate for a specific period or longer,
47 which transfers the charges in the charge transfer
48 section outside the imaging device,
49 causing the driving means to stop supplying the high
50 transfer rate driving signal to the imaging device at a
51 second time, thereby stopping the driving of the charge
52 transfer section,
53 switching the shutter means from the closing mode to
54 the opening mode after the second time and keeping the
55 shutter means in the opening mode at a third time,
56 causing the driving means to stop supplying the
57 charge discharging signal to the imaging device at a time
58 substantially equal to or before the third time and the
59 charge accumulating section to start to accumulate
60 charges,
61 switching the shutter means to the closing mode at a
62 fourth time within a exposure time from the third time,
63 and
64 causing the driving means to supply a normal driving
65 signal to the imaging device at a fifth time, until when
66 the shutter means has been kept in the closing mode since
67 the fourth time, thereby driving the charge transfer
68 section in the normal driving mode, which causes the
69 charge transfer section to output an image signal outside
70 the imaging device.

1 Claim 11 (original): The method according to claim 10,
2 wherein the fourth time almost coincides with the
3 exposure period from the third time, and
4 the fifth time coincides with the time when a delay
5 of Δt in the optical shutter means has elapsed since the
6 fourth time.

1 Claim 12 (original): The method according to claim 10,
2 wherein the fourth time is set before the exposure period
3 has elapsed since the third time, the exposure period
4 ending before the delay in the optical shutter means has
5 elapsed since the fourth time.

1 Claim 13 (original): The method according to claim 12,
2 wherein the exposure control means causes the driving
3 means to supply a high transfer rate driving signal to
4 the imaging device at a sixth time that the delay in the
5 optical shutter means has elapsed since the fourth time,
6 thereby driving the charge transfer section at high
7 transfer rate for a specific period, which discharges the
8 charges from the charge transfer section to the outside
9 of the imaging device, and at the fifth time that the
10 specific period of the high transfer rate driving has
11 elapsed, causes the driving means to supply a normal
12 driving signal to the imaging device, thereby driving the
13 charge transfer section normally, which causes the charge

14 transfer section to output an image signal outside the
15 imaging device.

1 Claim 14 (original): A method of controlling the amount
2 of light that reaches an imaging surface by controlling
3 driving means and shutter means in an image pickup device
4 including

5 a solid-state imaging device which has an imaging
6 surface composed of a large number of pixel elements
7 struck by light rays from the subject, which includes a
8 charge accumulating section for converting the incident
9 light rays into charges by the pixel elements and
10 accumulating the charges, a charge transfer section for
11 receiving the charges from the charge accumulating
12 section and transferring them, and a output section for
13 outputting the transferred charges as an image signal;

14 driving means which generates a normal driving
15 signal in a normal driving mode to drive the accumulating
16 section and the transfer section for transferring the
17 charges accumulated in the charge accumulating section to
18 the charge transfer section at a normal transfer rate and
19 causing the imaging device to output the image signal
20 from the output section, and which further generates a
21 charge discharging signal for discharging the charges
22 from the charge accumulating section outside the imaging
23 device and a high transfer rate driving signal for
24 transferring the charges in the charge transfer section

25 at a high transfer rate higher than the normal transfer
26 rate in a charge discharge mode; and
27 optical shutter means which is capable of switching
28 between an opening mode that permits light rays to
29 impinge on the imaging surface of the imaging device and
30 a closing mode that inhibits light rays from impinging on
31 the imaging surface, the optical shutter having a delay
32 in switching from the closing mode to the opening mode or
33 from the opening mode to the closing mode,
34 the method comprising the steps of
35 determining an exposure time;
36 comparing the determined exposure time with a
37 reference exposure time and setting one of a first and a
38 second photographic mode;
39 in the first photographic mode,
40 switching the shutter means to the closing mode at a
41 first time in response to the start in photographing the
42 image of the subject,
43 causing the driving means to start to supply a
44 charge discharging signal to the imaging device at the
45 first time, thereby discharging the accumulated charged
46 from the charge accumulating section to the outside of
47 the imaging device,
48 causing the driving means to start to supply a high
49 transfer rate driving signal to the imaging device at the
50 first time, thereby driving the charge transfer section
51 at high transfer rate for a specific period or longer,

52 which transfers the charges in the charge transfer
53 section outside the imaging device,
54 causing the driving means to stop supplying the high
55 transfer rate driving signal to the imaging device at a
56 second time, thereby stopping the driving of the charge
57 transfer section,
58 switching the shutter means from the closing mode to
59 the opening mode after the second time and keeping the
60 shutter means in the opening mode at a third time,
61 causing the driving means to stop supplying the
62 charge discharging signal to the imaging device at a time
63 substantially equal to or before the third time and the
64 charge accumulating section to start to accumulate
65 charges,
66 switching the shutter means to the closing mode at a
67 fourth time within a exposure time from the third time,
68 and
69 causing the driving means to supply a normal driving
70 signal to the imaging device at a fifth time, until when
71 the shutter means has been kept in the closing mode since
72 the fourth time, thereby driving the charge transfer
73 section in the normal driving mode, which causes the
74 charge transfer section to output an image signal outside
75 the imaging device; and
76 in the second photographic mode,

77 switching the shutter means to the closing mode at
78 the first time in response to the start in photographing
79 the image of the subject;
80 causing the driving means to start to supply a
81 charge discharging signal to the imaging device at the
82 first time, thereby discharging the accumulated charges
83 from the charge accumulating section to the outside of
84 the imaging device;
85 causing the driving means to start to supply a high
86 transfer rate driving signal to the imaging device at the
87 first time, thereby driving the charge transfer section
88 at high transfer rate for a specific period or longer,
89 which transfers the charges in the charge transfer
90 section outside the imaging device;
91 causing the driving means to stop supplying the high
92 transfer rate driving signal to the imaging device at the
93 second time, thereby stopping the driving of the charge
94 transfer section;
95 switching the shutter means from the closing mode to
96 the opening mode after the second time and keeping the
97 shutter means in the opening mode at the third time;
98 causing the driving means to stop supplying the
99 charge discharging signal to the imaging device at a time
100 substantially equal to or before the third time and the
101 charge accumulating section to start to accumulate
102 charges;

103 switching the shutter means to the closing mode at
104 the fourth time that the exposure period has elapsed
105 since the third time, the exposure period ending before
106 the delay dt in the optical shutter means has elapsed
107 since the fourth time; and
108 causing the driving means to supply a high transfer
109 rate driving signal to the solid-state image pickup
110 device at the sixth time that the delay dt in the optical
111 shutter means has elapsed since the fourth time, thereby
112 driving the charge transfer section at high transfer rate
113 for a specific period or longer and discharging the
114 charges in the charge transfer section to the outside of
115 the imaging device, and at the fifth time that the
116 specific period of the high transfer rate driving has
117 elapsed, causing the driving means to supply a normal
118 driving signal to the imaging device, thereby driving the
119 charge transfer section normally, which causes the charge
120 transfer section to output an image signal outside the
121 imaging device.

1 Claim 15 (original): The method according to claim 14,
2 wherein the reference exposure time is set to $TC = dt/2$
3 to $2dt$, where dt means a delay in the optical shutter
4 means.

1 Claim 16 (original): The method according to claim 14,
2 wherein the first photographic mode is set when the

3 specific exposure time T_s fulfills the expression $T_s <$
4 T_C , whereas the second photographic mode is set when the
5 specific exposure time T_s fulfills the expression $T_s \geq$
6 T_C .

1 Claim 17 (original): The method according to claim 14,
2 wherein the reference exposure time is set at 1.4 ms.

1 Claim 18 (original): The method according to claim 14,
2 wherein the period from the first time to second time is
3 set at $1T_{fr}/X$ or more, during which period the driving
4 means supplies the high transfer rate driving signal to
5 the imaging device, thereby driving the charge transfer
6 section at high transfer rate for a specific period or
7 longer, which transfers the charges from the charge
8 transfer section outside the imaging device, where X
9 means a multiple of the high transfer rate transfer rate
10 with respect to the normal transfer rate and $1T_{fr}$ means a
11 read period for one screen.

Claims 19-22 (canceled)

1 Claim 23 (currently amended): ~~The device according to~~
2 ~~claim 22,~~ A device for photographing an image of a
3 subject, comprising:
4 a solid-state imaging device including a charge
5 accumulating section on which the image is projected, for

6 converting the image into charges and accumulating the
7 charges, a charge transfer section for receiving the
8 accumulated charges from the charge accumulating section
9 and transferring them, and a output section for
10 outputting the transferred charges as an image signal;
11 driving means for driving the charge accumulating
12 section to accumulate the charges, the charge transfer
13 section to transfer the charges from the charge
14 accumulating section to the output section via the
15 transfer section at a normal transfer rate, and the
16 outputting section to output the image signal in a normal
17 driving mode;
18 optical shutter means which is capable of switching
19 between an opening mode for permitting the image to
20 project the image on the accumulating section and a
21 closing mode for inhibiting the image from being
22 projected on the accumulating section, the optical
23 shutter means having a delay in switching from the
24 closing mode to the opening mode or from the opening mode
25 to the closing mode; and
26 exposure control means for controlling the driving
27 means and the shutter means and including means for
28 determining an exposure time and means for comparing the
29 determined exposure time with a reference exposure time
30 and setting one of a first and a second photographic
31 mode, wherein, in the first photographic mode,

32 the exposure control means switches the shutter
33 means to the closing mode,
34 causes the driving means to start to discharge the
35 charges from the accumulating section to the outside the
36 imaging device,
37 causes the driving means to drive the charge
38 transfer section at a high transfer rate during a
39 predetermined period, which transfers the charges in the
40 charge transfer section to the outside the imaging
41 device,
42 causes the driving means to stop the transfer of the
43 charges in the charge transfer section,
44 switches the shutter means from the closing mode to
45 the opening mode,
46 causes the driving means to stop the discharge of
47 the charges from the accumulating section,
48 causes the driving means to the accumulating section
49 to start to accumulate charges during a predetermined
50 exposure period,
51 switches the shutter means to the closing mode, and
52 causes the driving means to drive the charge
53 transfer section in the normal mode, and to output an
54 image signal from the output section, and
55 in the second photographic mode,
56 the exposure control means switches the shutter
57 means to the closing mode,

58 causes the driving means to start to discharge the
59 charges from the accumulating section to the outside the
60 imaging device,
61 causes the driving means to drive the charge
62 transfer section at a high transfer rate during a
63 predetermined period, which transfers the charges in the
64 charge transfer section to the outside the imaging
65 device,
66 causes the driving means to stop the transfer of the
67 charges in the charge transfer section,
68 switches the shutter means from the closing mode to
69 the opening mode,
70 causes the driving means to stop the discharge of
71 the charges from the accumulating section,
72 causes the driving means to the accumulating section
73 to start to accumulate charges during a predetermined
74 exposure period,
75 switches the shutter means to the closing mode,
76 causes the driving means to drive the charge
77 transfer section in the normal mode, and to output an
78 image signal from the output section,
79 causes the driving means to drive the charge
80 transfer section a high transfer rate during a
81 predetermined transfer period after the shutter means is
82 switched in the closing mode, and
83 causing the driving means to drive the accumulating
84 section and the charge transfer section after the

85 predetermined transfer period in the normal transfer
86 mode,
87 wherein the reference exposure time is set to $TC =$
88 $dt/2$ to $2dt$, where dt means a delay in the optical
89 shutter means.

1 Claim 24 (original): The device according to claim 23,
2 wherein the first photographic mode is set when the
3 specific exposure time T_s fulfills the expression $T_s <$
4 TC , whereas the second photographic mode is set when the
5 specific exposure time T_s fulfills the expression $T_s \geq$
6 TC .

1 Claim 25 (original): The device according to claim 23,
2 wherein the reference exposure time is set at 1.4 ms.

Claims 26-29 (canceled)

1 Claim 30 (currently amended): ~~The method according to~~
2 ~~claim 29~~ A method of controlling a device for
3 photographing an image of a subject, the device
4 comprising:
5 a solid-state imaging device including a charge
6 accumulating section on which the image is projected, for
7 converting the image into charges and accumulating the
8 charges, a charge transfer section for receiving the
9 accumulated charges from the charge accumulating section

10 and transferring them, and a output section for
11 outputting the transferred charges as an image signal;
12 driving means for driving the charge accumulating
13 section to accumulate the charges, the charge transfer
14 section to transfer the charges from the charge
15 accumulating section to the output section via the
16 transfer section at a normal transfer rate, and the
17 outputting section to output the image signal in a normal
18 driving mode; and
19 optical shutter means which is capable of switching
20 between an opening mode for permitting the image to
21 project the image on the accumulating section and a
22 closing mode for inhibiting the image from being
23 projected on the accumulating section, the optical
24 shutter means having a delay in switching from the
25 closing mode to the opening mode or from the opening mode
26 to the closing mode;
27 the method comprising steps of
28 comparing the determined exposure time with a
29 reference exposure time; and
30 setting one of a first and a second photographic
31 mode,
32 wherein, in the first photographic mode,
33 switching the shutter means to the closing mode,
34 causing the driving means to start to discharge the
35 charges from the accumulating section to the outside the
36 imaging device,

37 causing the driving means to drive the charge
38 transfer section at a high transfer rate during a
39 predetermined period, which transfers the charges in the
40 charge transfer section to the outside the imaging
41 device,
42 causing the driving means to stop the transfer of
43 the charges in the charge transfer section,
44 switching the shutter means from the closing mode to
45 the opening mode,
46 causing the driving means to stop the discharge of
47 the charges from the accumulating section,
48 causing the driving means to the accumulating
49 section to start to accumulate charges during a
50 predetermined exposure period,
51 switching the shutter means to the closing mode, and
52 causing the driving means to drive the charge
53 transfer section in the normal mode, and to output an
54 image signal from the output section;
55 in the second photographing mode,
56 switching the shutter means to the closing mode,
57 causing the driving means to start to discharge the
58 charges from the accumulating section to the outside the
59 imaging device,
60 causing the driving means to drive the charge
61 transfer section at a high transfer rate during a
62 predetermined period, which transfers the charges in the

63 charge transfer section to the outside the imaging
64 device,
65 causing the driving means to stop the transfer of
66 the charges in the charge transfer section,
67 switching the shutter means from the closing mode to
68 the opening mode,
69 causing the driving means to stop the discharge of
70 the charges from the accumulating section,
71 causing the driving means to the accumulating
72 section to start to accumulate charges during a
73 predetermined exposure period,
74 switching the shutter means to the closing mode,
75 causing the driving means to drive the charge
76 transfer section in the normal mode, and to output an
77 image signal from the output section,
78 causing the driving means to drive the charge
79 transfer section a high transfer rate during a
80 predetermined transfer period after the shutter means is
81 switched in the closing mode, and
82 causing the driving means to drive the accumulating
83 section and the charge transfer section after the
84 predetermined transfer period in the normal transfer
85 mode,
86 wherein the reference exposure time is set to $TC =$
87 $dt/2$ to $2dt$, where dt means a delay in the optical
88 shutter means.

1 Claim 31 (original): The method according to claim 30,
2 wherein the first photographic mode is set when the
3 specific exposure time T_s fulfills the expression $T_s <$
4 T_C , whereas the second photographic mode is set when the
5 specific exposure time T_s fulfills the expression $T_s \geq$
6 T_C .

1 Claim 32 (currently amended): The method according to
2 claim 30 ~~29~~, wherein the reference exposure time is set
3 at 1.4 ms.

Claims 33-34 (canceled)